INPUT

MARKET FORECAST

U.S. Network Services Market

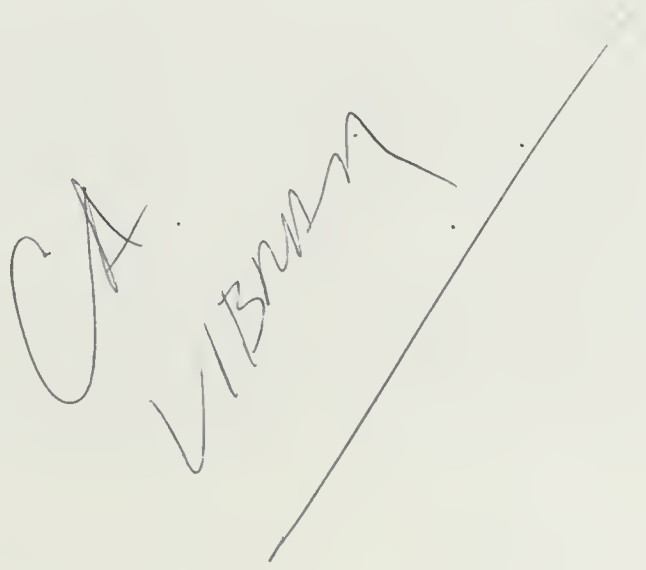
1993-1998

U.S. Market Analysis Program

JANUARY 1994

U.S. NETWORK SERVICES MARKET

1993-1998



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Abstract

This report offers the 1993-1998 analysis and forecast for the network services sector of the U.S. information services industry.

The network services sector consists of two delivery submodes: network applications and electronic information services. Network applications includes electronic data interchange, electronic mail, value-added applications and other applications-related services. Electronic information services includes on-line databases and news services.

The report offers an assessment of the issues and trends affecting these rapidly growing segments of the U.S. information services industry, projects the growth in market size for 1993 through 1998, and profiles selected vendors in this market sector. Market growth estimates are provided for fifteen industry sectors.

The report contains 56 pages and 24 exhibits.

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Information Services Market Analysis Program

U.S. Network Services Market, 1993-1998

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Introduction

This report is part of a series of market analysis reports written each year by INPUT on the key segments (delivery modes) of the U.S. Information Services industry. The delivery modes analyzed during 1993 are:

- Applications software products
- Turnkey systems
- Processing services
- Systems software products
- Network services
- Professional services
- Equipment services
- Systems integration
- Systems operations

INPUT's Market Analysis Program (MAP), a planning service for Information Services vendors, covers the first seven delivery modes. INPUT's systems integration and systems operations programs cover the last two delivery modes in the market analysis reports.

A
Purpose And Organization

1. Purpose

This report analyzes the network services delivery mode of the U.S. Information Services industry.

- The report includes five-year forecasts, an assessment of market drivers, analysis of competitive trends and identification of leading vendors.

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- The report assesses issues, trends and events within the U.S. economy, the U.S. Information Services industry and the network services delivery mode to provide the reader with a comprehensive foundation for understanding this market sector and for anticipating future directions.

The report provides readers with insights and information that will help them to:

- Review the forces shaping the market
- Develop internal corporate financial projections
- Identify new market, product and service opportunities
- Assess the competitive trends
- Determine potential market directions
- Assist in prioritizing investments

2. Organization

The balance of this report is organized as follows:

- Chapter II, Information System Environment, describes the information systems environment and user perspective as it relates to the network services delivery mode.

- Chapter III, Market Forecast, presents the forecast for network services by industry and for generic markets.

- Chapter IV, Competitive Analysis, discusses the competitive environment for information services within the network services delivery mode and offers selected vendor profiles.

- Chapter V, Conclusions and Recommendations, summarizes INPUT's analysis of this market.

- Appendix A, Forecast and Reconciliation, provides the databases and reconciliation for this report.

B
Scope and Methodology

1. Scope

This report addresses the U.S. Information Services industry for the network services sector (delivery mode). It includes user expenditures that are noncaptive and generally available to vendors. Many large organizations have portions of their information services requirements satisfied by internal divisions. The resulting expenditure is not available for competitive bid by the general vendor community and is not included in INPUT's projections.

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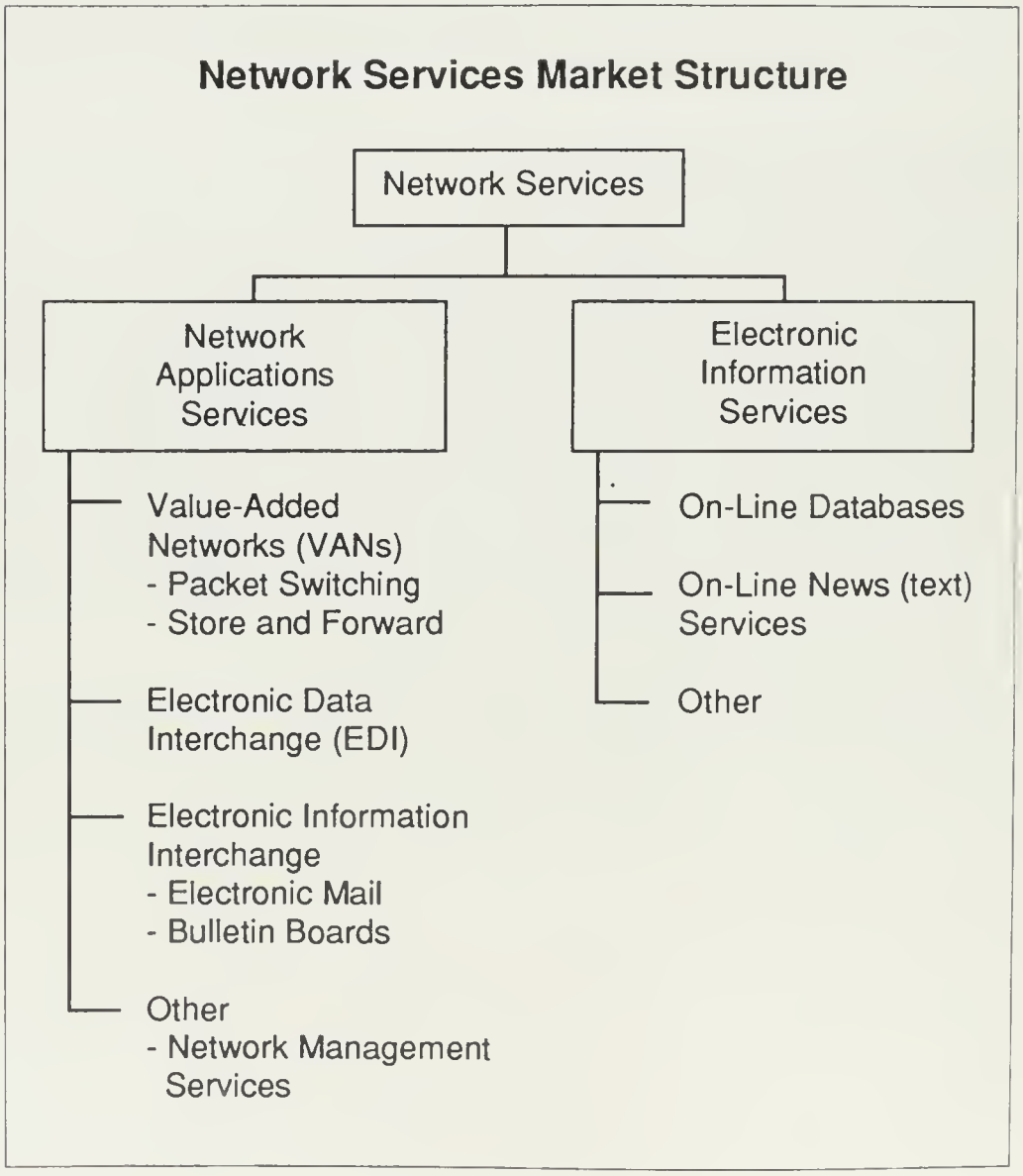
2. Delivery Mode Description

There are two submodes within the network services delivery mode: electronic information services and network applications. All network application services are considered purchased by specific industry sectors—that is, they are industry-specific. Thus forecasts for network applications within the 15 industry sectors add to the forecast totals for the delivery mode as a whole. Electronic information is purchased as industry-specific, as well as on a generic basis across industries.

EXHIBIT I-1



Network services sold in conjunction with processing services are included in the definition of the network services delivery mode.

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3. Methodology

As in past years, INPUT surveyed Information Services vendors to determine their U.S. Information Services revenues and to query user information systems organizations about expenditures and outside services acquisition plans.

INPUT'S annual forecasting process is broken into two major parts: base-year expenditure calculations and market forecasts.

INPUT reconciles its new forecasts with those from the previous year. Differences due to market restructuring and other factors are explained.

C
Economic Assumptions

As noted in the Economic Assumptions section of the Department of Commerce's 1993 U.S. Industrial Outlook, U.S. economic growth in 1992 was somewhat less than what was forecast in the prior year. The very slow recovery seen at the end of 1991 continued into 1992, with unemployment remaining at undesirable high levels—a condition fueled primarily by corporate restructuring and defense industry cutbacks. Even though retail sales were at an encouraging high during the 1992 Christmas season, business expenditures remained low. This was due to an ongoing desire to reduce costs and improve profits, as well as uncertainty over the precise nature of any economic (primarily tax) reforms proposed by the new Clinton administration.

In 1992, the major burden for implementing economic policy fell on the Federal Reserve, a strategy that caused the Fed to steadily reduce the federal funds rate from 8% in June 1990 to 3% in September 1992, forcing a general reduction in all interest rates to the lowest levels in years.

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The outlook for 1993 remains cautiously optimistic, with many of the uncertainties tied to the new administration's attempts to reduce the budget deficit while stimulating a still-sluggish economy. At this time, messages remain mixed, with new corporate taxes favoring small businesses and those who make capital investments, while penalizing larger corporations, especially service firms, through a 2% increase in the top corporate tax rate from 34% in 1992 to 36% in 1993. Personal income will be reduced by increases in income taxes averaging 3% for middle income families and 5% for those in the highest income categories. All taxpayers, business and individual, will also experience higher energy costs due to proposed energy taxes. Many critics of the administration fear that the new taxes risk is slowing the economy just when it started to show some healthy growth.

INPUT uses the Blue Chip Consensus (economic) report and various other sources (Federal Reserve, IMF), to identify anticipated economic growth trends and incorporate GDP assumptions in industry and delivery mode financial forecasts. Economic growth in 1992 had a very slight movement upwards, but the 3% growth in GDP anticipated for that year is now forecast for 1993. This modest growth resulted from the pressures placed upon the defense industry, tax uncertainties, a weak commercial real estate market, high federal debt, slow growth in the labor force, cautious financial institution lending policies and the growing economic interdependence of industrialized nations. Balancing these growth inhibitors are the healthy gains in corporate profits noted in both 1992 and 1993 and a pattern of increased consumer spending, especially for the Christmas season.

In summary, U.S. economic fundamentals strengthened in 1992, establishing a foundation for the modest but steady 3% growth expected for 1993.

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Information Systems Environment

A
Industry Status

1. Network Services Marketing Trends

The market for network services has expanded over the past 10 years as a result of:

- Strong user demand for network services
- Global demand for Electronic Information Services (EIS) and network applications
- Continual improvement of network services
- The availability of network technology upgrades

Users have shown increasing interest in network services, which has led to increased use of these services. In an effort to satisfy user demands to access electronic information, vendors provide services and applications that offer information about materials, production processes, business activity, financial markets and a host of other topics.

Network services are a critical part of the overall business process for many organizations. Businesses' dependence on network services will increase as more services become available.

Furthermore, demand for network services within the global economy is expanding because organizations handle many business functions on a worldwide basis, such as credit checking, engineering, shipping, trading and travel. Particularly in trading situations, the availability of on-line data is essential for evaluating global opportunities. Also, network appli-

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cations serve banks, other financial institutions and corporations on a global basis. Eliminating delays in initiating business activities or resolving problems, messages and payment instructions from one country to another are of major importance to multinational corporations.

Constantly improved network capabilities that allow contact with more U.S. and international end-points, as well as technology that accesses and transmits data faster, also drive EIS and network application use. From a vendor point of view, users reacted favorably to increased availability of on-line information, as well as increased access to the infrastructure for on-line information (such as EDI).

EDI (Electronic Data Interchange) implementation is most cost-effective between companies with stable trading relationships. Consequently, organizations tend to only integrate their larger strategic trading partners. Thus, vendors should investigate the opportunity presented by those companies and industry groups where the factors of support and mutual cooperation are present. Users are integrating EDI, electronic mail and other network applications into their Information Systems (IS) primarily to satisfy:

- Intercompany pressures, as well as pressures by suppliers and/or customers, to quickly communicate information. Electronic mail and EDI can quickly transfer data to remote company locations, clients and suppliers.

- The desire to save time and funds by moving information electronically. The increased speed of obtaining information over the last few years resulted in expanded opportunities to gain revenues and save costs.

Network services buyers believe these services are a necessary way of doing business rather than an enhancement to their business activities. Additionally, users expect EIS and network applications to increase revenues or reduce costs.

The trend of greater dependence and global expansion of network services supports a corresponding trend of continual improvement for these services. Developments in network technology over the last five years include:

- The use of new technology to increase transmission speeds and connectivity

- The development of multimedia

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- Simplification of user operations
- The use of new techniques in obtaining data or implementing network applications

2. Vendor Strategies

In order to reduce costs and meet user service demands, vendors place high importance on productivity improvement. In addition, as a result of pressure from users to reduce service costs, vendors respond by reducing operating costs to achieve a lower pricing structure.

Vendors plan to introduce new products and services with lower price points to meet customer demands for service improvements. Vendors consider these efforts key to promoting growth in the network services industry.

New products and enhancements include:

- Additional consulting services
- Systems and application integration
- Messaging services integration
- Migration to open systems
- Distributed, integrated platform construction
- Enhancements to network throughput

Thus, introducing new technology and services is a major vendor issue. Increasing costs and narrowing profit margins make many vendors less prone to replace older technology or expand services unless there is sufficient demand to ensure success. However, some rapidly expanding firms in the network services market continue to introduce new services.

B

Organizational Impact on IS

1. Restructuring America

Downsizing, re-engineering and outsourcing are major business trends that emerged in the early 1990s as concepts that influence and drive American business for the balance of this decade. Although some apply the term rightsizing (instead of downsizing), the concept affects all segments of

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business and involves a migration away from overfunded, overstaffed and overequipped centralized resources. It is a cost-effective distribution of assets and business activities that are placed closer to or under the control of the ultimate user.

Re-engineering implements or facilitates downsizing. Also, it indicates the current trend in business to move toward more competitive, cost-effective and efficient activities. Re-engineering and downsizing are logical responses to increases in business competition. These two areas are an inevitable result of production and staffing excesses of the 1980s and the economic downturn in 1991, 1992 and 1993.

Both of these concepts affect all facets of American industry, including areas within information systems and the associated network services marketplace.

Outsourcing information systems management, or at least significant elements of information systems, continued to gain momentum during 1993. Encouraged by the recessionary economy, large organizations increased their consideration of outsourcing alternatives.

Transferring much of the financial and technological risks of a project or operation to a specialist can offer numerous benefits:

- Disconnecting the information technology part of the solution from the business decision will become more important. This happens when management is convinced that an outsourcing alternative will make business more effective and cost less—with the exception of mission-critical applications/systems. The appeal of the vendor's offer to take on risk either in a project (systems integration) or in system operations will continue to grow during the 1990s.

- The nature of most outsourcing activities within larger organizations often makes them favor the large vendors, adding impetus to the trend described above. If there is major risk involved, the buyer will bet on the company most able to accept risk and take responsibility.

- Buyers gaining access to a broad information technology on an "arm's-length" business basis in a single decision is perhaps the most important benefit. For instance:

  - The systems integration vendor provides all the needed expertise in a new technology at the beginning of a project. There is no internal training lag time while the information systems staff gains the knowledge and experience required.

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- The systems operations vendor provides a full utility-based service at a predictable cost over a number of years. This should cause fewer surprises over the term of the contract.

- Outsourcing companies are also accepting responsibility for changing platform architecture, e.g., client/server. This requires additional personnel who are acquainted with the new technological direction.

Buying packaged application software is a well-established practice in the U.S. market. However, changes in the way U.S. organizations are managed, coupled with the availability of low-cost, high-performance client/server computing, brings new impetus to the application solutions market.

- The fundamental decentralization of U.S. business management, with the corresponding reduction of corporate staffs, creates a major requirement for business unit (distributed) application systems. Furthermore, the buyer is not an information systems professional and is more willing to outsource (buy) to acquire standard products, frequently with some customization.

- Just when smaller business units need independent application solutions, there is a hardware revolution to support the need. Client/server technology provides affordable, high-powered computing.

Finding a VAR who can provide a package, plus customize systems on client/server-based software, brings the solution value of systems integration to the decentralized business unit.

In line with the shift of outsourcing systems management to systems integrators and systems operations firms, the buyer also seeks to gain more relationships with a broader range of traditional professional services vendors. Instead of contracting for temporary personnel, the buyer contracts for services like applications maintenance and applications management.

- Applications maintenance is based on 24-hour contracted support. The vendor provides a set level of services and interacts directly with the user.

- Applications management represents the contracted development and maintenance of a set of applications. The vendor provides software, expertise and staff to ensure that the application is successful over an extended period. Firms supplying applications software may also provide applications management.

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2. User Influence

The decision maker for purchasing information services remained relatively constant until the late 1980s. The information systems executive and key staff (systems development and data center operations managers) decided when to go outside and with whom to contract.

This leadership changed significantly during the past few years and promises to change even further in the future. As the Information Services vendor moves to provide long-term service or a full solution, the general manager is now becoming the buyer. The impacts are significant:

- Business and operational impact is now more important than technology.
- Impact of the information systems function becomes less direct and more consultative.
- Ability to try new ideas and approaches is increased.
- Time to completion is controlled by the organization's ability to afford, not by its ability to develop information systems.

Users expect network services vendors to:

- Ensure a low incidence of problems that would interrupt operations.
- Provide high-quality service emphasizing accuracy, completeness of information and presentation formats on screens.
- Provide prompt response and action to inquiries.
- Offer reasonable pricing.
- Plan for future client needs.

The most critical items, such as a low incidence of problems and availability of data, are more important than price in selecting vendors, particularly for EIS products. And, when network applications users select vendors, they are less interested in pricing and more interested in support services adherence to standards and communication capabilities.

Clients and prospective clients of network services also expect vendors to plan for their future needs. This could involve research on needs for data that are not met with current products, or an alternate means of delivering information. Planning could also involve new or changing standards, new communication capabilities or software products that support network applications.

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C
IS Trends

1. Technological Impact

Significant new technologies that became available in the late 1980s are gaining momentum in the 1990s. The underlying characteristic of much of this new technology is a shift in the technological foundation.

Incorporating new technology into network systems solutions is a critical component in the sale of network services. The use of new workstations, PCs and client/server distributed architecture makes it possible to develop systems that facilitate the use of EIS and network applications. Key catalysts that facilitate the advancement in network technology are shown in Exhibit II-1.

EXHIBIT II-1

Key Elements Driving Technological Change

- Client/server architecture
- Distributed networks
- Engineer/re-engineer software services
- Multimedia
- Network interopability
- Wide area networks (WANs)

Client/Server Architecture allows users at any location to access any applications within the enterprise and any application information needed to perform.

Distributed Networks are network architectures in which information resources do not reside in a central location. This architecture is transparent to the user, thus users can access an enterprise's information processing resources as if they were a single, consistent operating environment. Local area networks (LANs) and client/server networks are distributed environments.

Engineer/Re-engineer Software Services include user requirements definition, systems design, contract programming and documentation of software performed on a custom basis.

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Multimedia is the combination of various media (audio, graphics, text, video) on a desktop computer.

Network Interoperability is the interconnectivity between heterogeneous networks, such as Ethernet and token ring.

Wide Area Networks (WANs) are those technologies that incorporate services such as, packet switching (frame relay, asynchronous transfer mode [ATM], Switched Multimegabit Data Service [SMDS]) and circuit switching (ISDN).

Each of these elements causes organizations to re-evaluate key aspects of their information systems strategic architecture. All of these new technologies and foundations can confuse buyers and vendors. Confusion slows the decision-making process for both buyer and vendor because their strategies need to be revised, investment plans need to be realigned and re-education needs to be addressed. For example, users will want to integrate client/server applications (accounting, financial, databases, document management, EDI, electronic mail, imaging, multimedia) into their networks as these applications become available.

Deciding how best to integrate new technology into the existing IS infrastructure and how to manage the resulting network infrastructure slows adoption of new technologies in the short term. However, it does create new vendor opportunities over the longer term.

Standards are also driving every major computer manufacturer and software product developer to revise strategies and change product development plans. Resulting from the process of developing standards, new products are delayed and subsequently require a longer introductory sales period. For instance, the user interface of the personal computer with its graphic pull-down menu and window format is now the preferred choice of users. Text-based interfaces of the 1970s and 1980s are, in many cases, less acceptable. This graphic user standard has made an impact on every major software product developer. They must now spend time and money to re-engineer these user interfaces.

Downsizing—for instance, moving an application to a client/server-based installation—will be the greatest phenomenon of the 1990s. Whether the installation is actually downsized, it will be moved to a new processing location and take on new characteristics. Major re-engineering of internal systems by the information systems function and a shift to buying server-based application products are also underway. All of the impacts are not known. However, pricing of software products based on the size of the platform can be expected to change.

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The growing use of PCs, workstations and LANs mandated a move to integrate information networks of large and small organizations. Today's networking products support any-to-any network connections through interoperable architectures. This permits a company's distributed applications to be folded into an all-encompassing "enterprise" network configuration that has been discussed for years, but was never possible.

The way data is stored and turned into information has been fairly constant since creating the first hierarchical DBMS in the early 1970s. The challenge has been to build databases which did not require new types of components. However, while the shift to relational and distributed DBMSs is significant, it is image processing which causes major re-engineering to database architectures in larger organizations, and new investment will probably be required.

Positive and negative impacts of this shift in technological foundation follow.

Positive impacts:

- New types of solutions will become available.
- The role of the user in information systems will continue to expand.
- Opportunities for new as well as existing vendors are created.
- Application systems can be increasingly molded to the character of the organizations that they support.
- Improved price/throughput performance of networks.

Negative impacts:

- Any shift causes confusion and hesitation in the near term. The magnitude of the current technology shift could cause confusion and slow investment through the middle of the decade.
- The demand for resources to support the shift to client/server technology in organizations with large centralized systems will cause conflicting priorities between re-engineering and meeting new requirements.
- The technology shift now in progress creates a significant need for additional training and education.
- Growth is slowed while new technology is learned.

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INPUT believes that over the five-year period of this forecast, the positives greatly offset the negatives. Nevertheless, an item of concern to vendors is whether the introduction of alternate technology or application approaches will unfavorably impact network services. For instance, significant developments in CD ROM technology have led to the consideration and/or use of CD ROMs for economic, technical, legal and other information that does not require real-time updates. A system has been developed that records each time a particular piece of information has been accessed on a CD ROM. This enables CD ROM vendors to bill for user accesses to the CD ROM database.

Users are also discussing segmentation of data, which they currently obtain from a vendor source, so they can use an on-line database for real-time needs and a CD ROM for more static needs.

2. Leveraging The Changing Public Data Highway

The very infrastructure that transmits electronic information services and network applications is rapidly changing as improvements in packet switching and circuit switching technologies proceed and deployment of fiber-optics within the telecommunication network continues (see Exhibit II-2). Integration of these telecommunications advancements into existing networks is being promoted not only by product and service companies, but also by national government officials.

EXHIBIT II-2

Public Network Developments

- Packet switching
  - Asynchronous transfer mode (ATM)
  - Frame relay
  - Switched multimegabit distribution service (SMDS)
- Circuit switching
  - Integrated services digital networks (ISDN)
- Transmission
  - Synchronous optical network (Sonet)

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The National Information Infrastructure (NII) concept encouraged by Vice President Al Gore is essentially an electronic superhighway that will interconnect different organizations on a nationwide basis, promoting the proliferation of electronic commerce. This business-to-business interconnectivity will impact all facets of the capitalistic "food chain" by permitting suppliers and purchasers to quickly and efficiently conduct business transactions with each other. In addition, these transactions will extend directly and electronically to interact with the primary entity in the "food chain" ... the consumer.

As many service and product companies work toward the future goal of interoperability within an enterprise networking environment, current technology advancements within the electronic infrastructure are impacting businesses today. Frame relay networks improved throughput efficiencies over the traditional packet transmission methods. Additionally, an increase in the level of sophistication in value-added networks (VANs) over the level just a few years ago has given organizations a wide scope of on-line applications from which to choose. Exhibit II-3 is a partial listing of vendors who provide frame relay networks and VANs.

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EXHIBIT II-3

Vendors Offering Frame Relay Service and VAN's

Vendor	Frame Relay Service	Value-Added Network
Advantis		Advantis
Ameritech Advanced Data Service	Ameritech Frame Relay	
AT&T	InterSpan Frame Relay Service	EasyLink Services
Bell Atlantic	Bell Atlantic Frame Relay Service	
BellSouth	Frame Relay	
British Telecom	ExpressLane	Global Network Services
Cable & Wireless Communications	LAN Connect Frame Relay	Managed Data Services
CompuServe	Frame-Net	Packet Services
GE Information Services		GE Information Services
Graphnet	GraphPak Frame Relay	GraphPak
Harbinger*EDI Services		Harbinger*EDI
Infonet Services		Infonet
MCI Communications	VPDS Frame Relay	MCI Mail
Nynex	Frame Relay Service	
PacNet	PakLink	
Rogers Network Services	Frame-Path	
Southwestern Bell	Frame Relay	
Sprint	Sprint Frame Relay Service	SprintNet
Sterling		Ordernet Services
U.S. West Communications Advanced Communications Services	Frame Relay Service	
WilTel	WilPower	

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Frame relay technology, which supports the bursts of data traffic associated with E-mail and client/server applications, has an effect on users' network designs. As a result, the competition among carriers is changing the way network services are provided to organizations. A frame relay service operates over a public fast packet network and provides users with connectivity for data transmissions. Frame relay networks currently operate between 56Kbps, T1 (1.544 Mbps) and potentially up to T3 (45 Mbps) in the future; they accommodate certain peaks (bursts) in traffic that exceed a fixed (contracted) transmission rate. However, frame relay providers have not agreed upon a standardized pricing methodology. Users face a difficult process when comparing different services on a price/performance basis.

Currently, all three interexchange carriers (IXCs)—AT&T, MCI and Sprint—offer frame relay services. Other providers include Wiltel, Compuserve and BT North America.

By increasing the bandwidth or throughput of vendor networks through the use of faster transmission technologies (capable of efficiently passing a mix of voice, data and video) such as Asynchronous Transfer Mode (ATM), Synchronous Optical Network (SONET) and Switched Multimegabit Distribution Service (SMDS), vendors will support growing requirements for imaging and multimedia applications.

Advanced switching and increased transmission speeds offered by ATM, SONET and SMDS will allow multimedia applications to exist on a demand basis. ATM is expected to allow the same high-bandwidth applications that run on a LAN to also run on a WAN. Under this scenario, the network will be able to support data, voice and video (multimedia).

As multimedia technology develops and associated pricing comes down, users will make significant commitments to this audio, image, full motion video and textual medium. For instance:

- To accommodate high-speed data rates of multimedia's full motion video component, there must be appreciable increases to the capacities of current telephone circuitry. Network services vendors should monitor local exchange carriers (LECs), competitive access providers (CAPs) and cable TV companies as well as interexchange carriers in their development of high-speed, switched networks that will support multimedia.

- New transmission protocols must be developed to specifically support full motion video. Among other challenges, current protocols tend to send more control information than is necessary.

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- Currently, these high-capacity, broadband circuits provided by the LECs and Regional Bell Operating Companies (RBOCs) are very expensive; however, regulators and legislators are strongly promoting the cross-fertilization of markets between telephone, cable TV and competitive access providers. Ultimately, the combination of the fiber optic medium, in conjunction with new, high speed switching systems, will become the technological foundation for multimedia.

- Potentials for a multimedia data network, supported through some form of wireless interface (such as Cellular or Personal Communications Services), are not well defined yet. The full motion video component of multimedia requires a much larger frequency bandwidth capacity than data and voice areas. As a result, wireless installations must weigh the potential for video revenues compared to the potential for many more voice and data channel revenues. This classic price performance issue of a limited usable frequency spectrum can be measured as the potential for revenues generated per Megahertz. The Federal Communications Commission regulates these much sought-after frequencies and determines the methods of allocation.

INPUT believes that pending legislation and regulation revisions will promote further convergence of and create the foundation for cross-fertilization of markets between local carriers and cable TV companies. Ultimately, a highly competitive market will develop that supports these technologies by local phone companies, cable TV organizations and alternative competitive access providers (CAPs). Coupling these events with the potential demand for interactive TV, the Clinton administration's promotion of an Electronic Superhighway and local carriers' intent to provide fiber optics "to the curb," will enable these technologies to expand rapidly.

Expansion of the network services marketplace has also been bolstered by advancements in value-added networks (VANs). Increased sophistication in X.25 networks provides users with greater access to network services than just a few years ago. VAN providers (see Exhibit II-3) use network improvements (such as international links) to offer new services. For instance, AT&T and its Easylink global messaging service are said to be considering a collaborative effort with a European partner called Eunetcom. While Eunetcom's pending alliance between France Telecom and Deutch Bundespost Telekom have yet to satisfy certain European Community competition rules, IBM signed a letter of intent as their first customer. Other carriers pursuing these global markets are the BT/MCI alliance, Unisource alliance, Cable & Wireless and Stentor.

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Currently, value-added networks provide international links as well as a diversity of application processing services. Exhibit II-4 presents a partial listing of applications offered by VANs.

EXHIBIT II-4

Partial Listing of VAN Applications

- Database retrieval
- EDI
- E-Mail
- Managed router networks
- Transaction processing
- X.400
- X.500

By the middle of the decade, some of these high-bandwidth services will compete directly with packet switched services provided by VANs. This lends credence to GEIS' shift away from providing these types of network services.

3. Market Forces

a. Driving Forces

One of the paramount forces driving the network services market is increasing demand for electronic information (see Exhibit II-5).

- Additional information about materials, production processes, drugs in use, business activity, financial markets and a host of other topics are proliferating and increasing the amount of on-line information.

- On-line information can be affected by factors related to the economic conditions of users, more effective methods of using information, limitations in auditing and control of information and other influences. However, none of these factors cause users to project reductions in EIS.

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EXHIBIT II-5

Network Services Driving Forces

- Increased need for electronic information
- Growing pressure to use network applications to remain competitive
- Improved network capabilities
- Lack of in-house network technology and applications expertise
- Potential tool for revenue generation and cost reduction for organizations

The forces producing increased use of EDI, electronic mail and other network applications stem predominantly from two trends:

- Pressures by corporations on their suppliers or customers
- The desire to save time and funds by moving information electronically

Constantly improving network capabilities that allow contact with more end-points in the U.S. and globally, coupled with technologies that lead to faster access and data transmission, are the major forces which drive EIS and network applications.

- Electronic mail and EDI can reach more company locations, clients and suppliers
- According to users, increased speed in obtaining information over the last few years resulted in more opportunities to gain revenues and save costs

Many users do not have sufficient ongoing research and network capabilities or enough technically trained staff to take advantage of increased connectivity or speed of transmission. Major corporations indicate that it is difficult to address the scope of technological change. This uncertainty is another force that drives the use of network services vendors.

Most organizations do not have sufficient ongoing in-house technical staff that can modify an existing network to take advantage of newly introduced connectivity technology or transmission speeds.

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b. Market Inhibitors

Users point primarily to three inhibitors that obstruct plans for network services (see Exhibit II-6):

- Delayed economic recovery. However, some users are expanding the use of these services to stimulate business.
- Use of alternative solutions. Competitive products include CD ROM offerings. Significant developments in the use of CD ROM technology led to consideration and/or use of CD ROMs for economic, technical, legal and other information that does not require real-time updates. Information that is static can be provided much more economically on CD ROM than from on-line databases. There are now economic and financial databases available on CD ROM which include, in some cases, data that is also available from on-line databases.
- Lack of in-house networking skills/knowledge/staff. In some circumstances, users note that as a partial result of downsizing, they are left with fewer capable staff to evaluate needs and possible vendor network services. This has resulted in the delay of network service implementation.

EXHIBIT II-6

Network Services Growth Inhibitors

- Continued delay of economic recovery
- Expanded use of CD-ROM technology
- Lack of critical network skills

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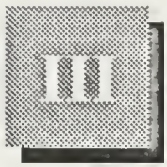

Market Forecast

A
Market Structure

The structure of the network services market relates to network capability developments by vendors during the 1960s, the first step in the process was connecting networks to computing installations by GE and other vendors.

- These networks were first used for electronic messages and payment instructions, in addition to remote processing and program development.
- Providers of electronic information tended to come to vendors of network and remote computing services from organizations that used information or became aware of the value of proprietary databases.

In effect, the network services market developed historically from services involved with moving data to product-based services. The current structure of the market reflects that division of services, as shown in Exhibit III-1.

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EXHIBIT III-1

Network Services Market Structure

Service-Based	Network Applications • EDI • Electronic mail • Other VAN capabilities
Product-Based	Electronic Information Services • On-line databases - Security, fixed income, foreign exchange and other market data - Credit data - Economic, technical and other data • On-line unstructured data - Bibliography, text - News

The services noted in the exhibit can be further divided into: (1) those that supply financial, product, technical and other data; and (2) those that supply unstructured information, such as news. Vendors who supply product-based services—such as TRW and Dun & Bradstreet—do not always provide network applications.

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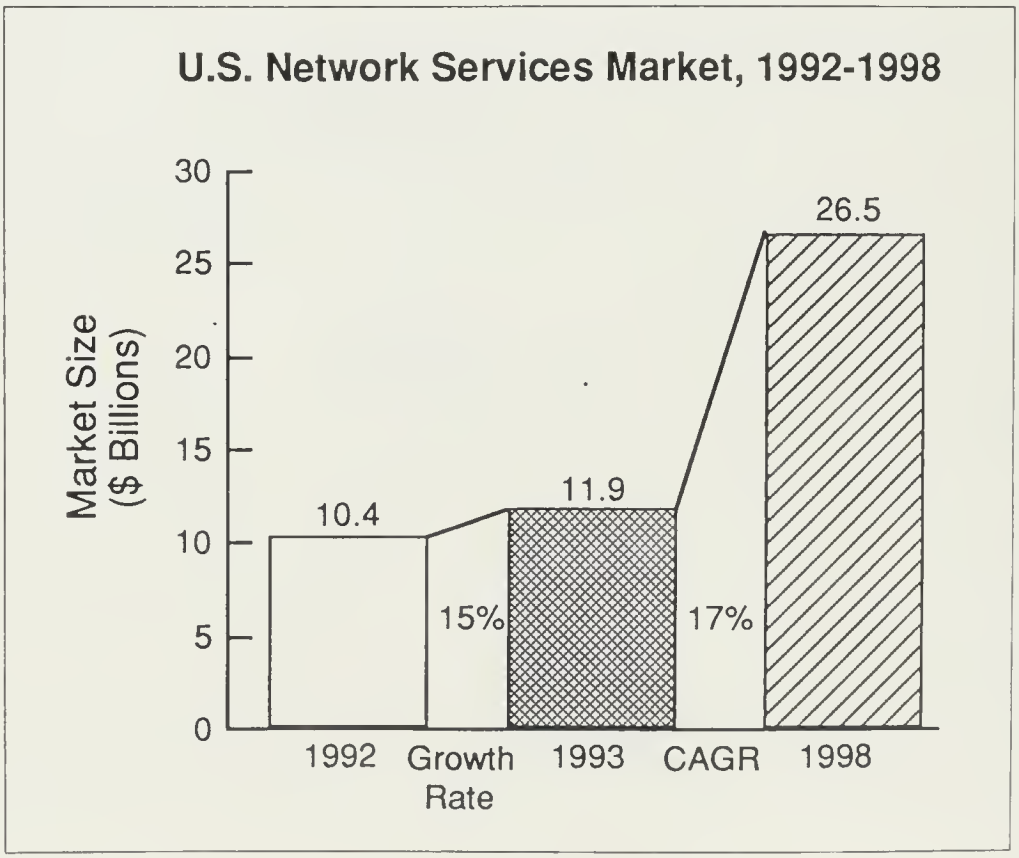
B
Network Services Market

1. Overall Market

The market for network services grew from a 1992 level of $10.4 billion in user expenditures to a level of $11.9 billion in 1993—a slightly increased growth rate of 15%. This slight improvement of 1% also reflects user expenditures, which will now grow at a compound annual growth rate (CAGR) of 17% during the next five years to reach $26.5 billion in 1998, as noted in Exhibit III-2.

EXHIBIT III-2



Continuing expansion in network services is because growth can assist in revenue generation or cost reduction while creating a more automated way of conducting business.

- Network applications provide electronic rather than paper means of handling business with customers, suppliers, service companies and government offices—as well as with other offices in an organization.

- Information necessary to make decisions, conduct research, aid clients or keep processes functioning can be sought and accessed more rapidly and on an automated basis.

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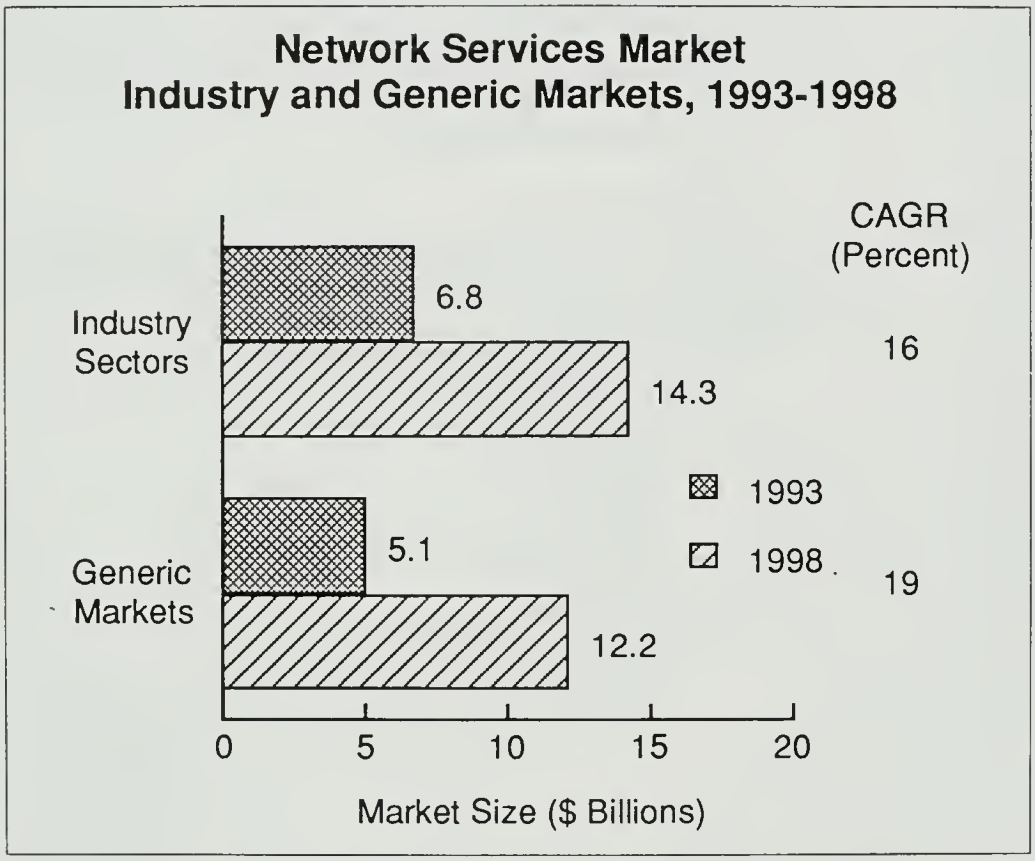
2. User Expenditures by Industry and Generic Sectors

User expenditures of $11.9 billion for network services in 1993 can be divided among industry and generic markets, as shown in Exhibit III-3. By *generic*, INPUT means this service can be used in such a broad or general way across industries or in applications that it is impossible to divide it by cross-industry or industry categories.

EXHIBIT III-3



Differences in use of network services between industry markets is pronounced, as shown in Exhibit III-4, with the wholesale distribution, discrete manufacturing, telecommunications, retail distribution and state and local government industry sectors all showing growth at 20% CAGR or better through 1998. Only the utilities sector, with its stable market, will have single-digit (8%) growth.

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EXHIBIT III-4

Network Services Market
User Expenditures by Industry, 1993-1998

Industry Sector	User Expenditures $ Millions		1993-1998 CAGR Percent
	1993	1998	
Discrete Manufacturing	128	334	21
Process Manufacturing	1,079	2,265	16
Transportation	422	997	19
Utilities	32	46	8
Telecommunications	141	349	20
Wholesale Distribution	403	1,217	25
Retail Distribution	269	734	22
Banking and Finance	892	1,859	16
Insurance	256	478	13
Health Services	661	1,420	17
Education	253	553	17
Business Services	685	1,148	11
Federal Government	1,252	2,278	13
State and Local Government	150	377	20
Miscellaneous Industries	158	286	13
Industry-Specific Total	6,781	14,341	16
Generic Markets	5,145	12,205	19
Total Network Services	11,926	26,546	17

Expenditures in generic markets will grow more rapidly than in industry markets over the next five years, as shown in Exhibits III-3 and III-4. This higher growth rate is because the market for generic services is composed of a subset of EIS that includes equity pricing, other financial information and on-line news services areas that are entering and growing in a number of submodes and niches in retail distribution.

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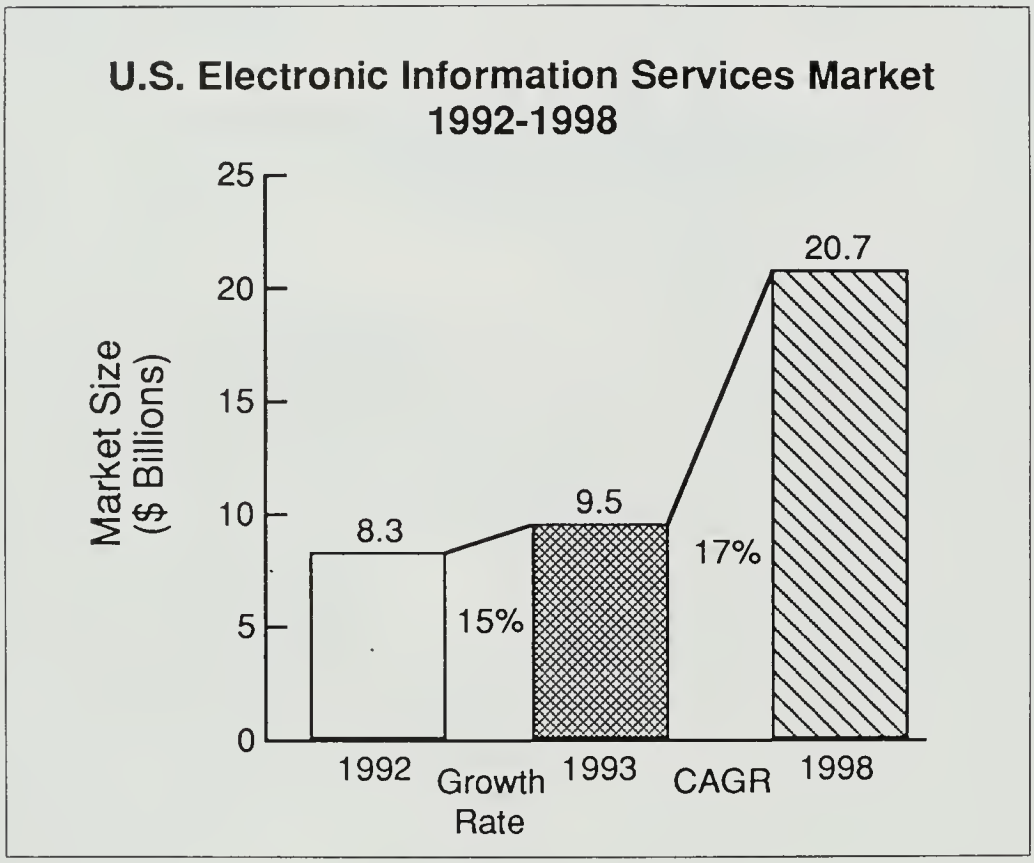
3. Electronic Information Services (EIS) Market

Exhibit III-5 shows that user expenditures for EIS will continue to grow at a rate of 15% in 1993 to $9.5 billion and rise at a CAGR of 17% between 1993 and 1998 to a level of $20.7 billion in 1998.

EXHIBIT III-5



Expenditures for EIS are divided into industry and generic components noted in Exhibit III-6. The expenditures for generic markets continue to grow at a faster rate, because vendors selling access to generic data for one market usually find that the data can also be sold to other markets.

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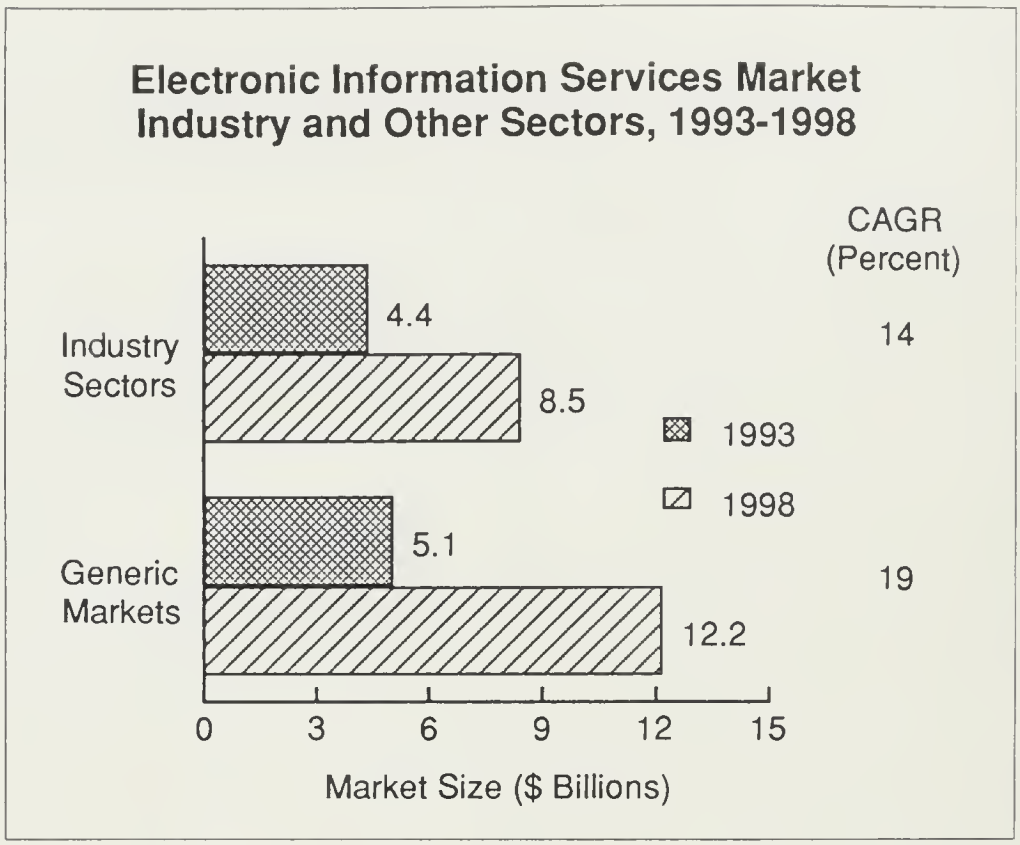
EXHIBIT III-6



Information delivered through EIS is divided into two main categories noted in Exhibit III-7: on-line databases and news services. Expenditures for new services continue to grow at an aggressive five-year rate of 23%, while on-line databases show a respectable 16% CAGR. Both benefit from regulatory activity permitting RBOC (Remote Bell Operating Company) to offer content-based information services, and by the proliferation of PCs which allow broader user access.

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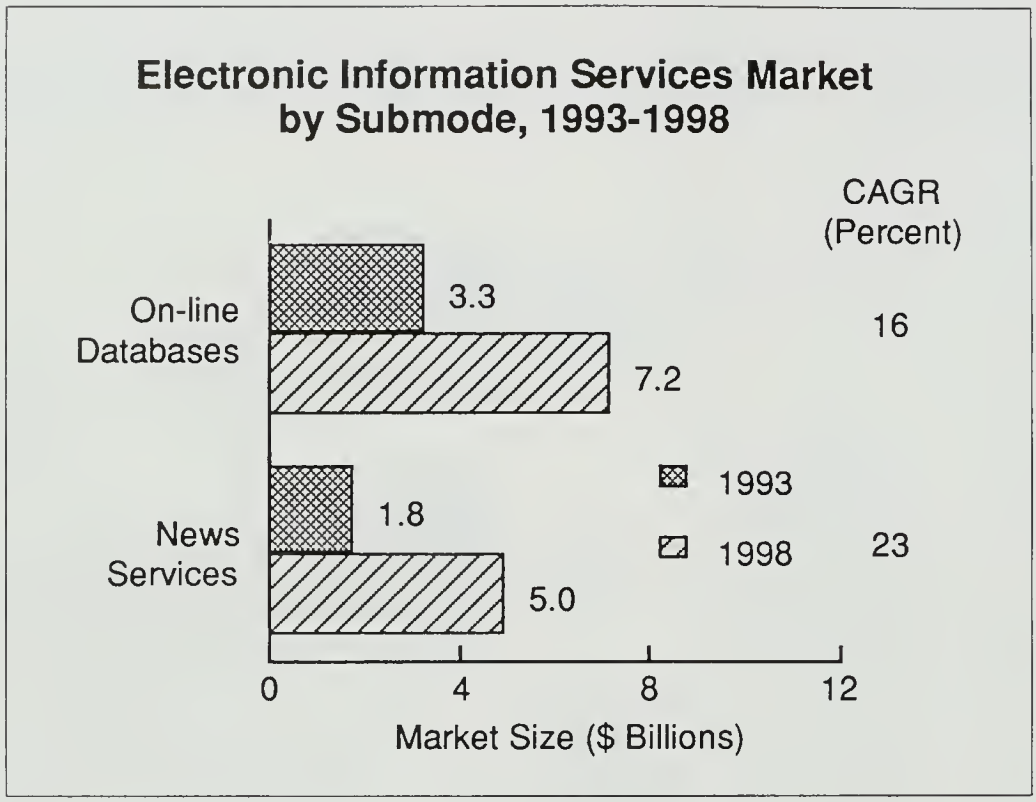
EXHIBIT III-7



As shown in Exhibit III-8, banking and finance, process manufacturing and business services continue to lead the EIS industries. Utilities remain the smallest and slowest-growing EIS industry sector.

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EXHIBIT III-8

Electronic Information Services Market
User Expenditures by Industry, 1993-1998

Industry Sector	User Expenditures $ Millions		1993-1998 CAGR Percent
	1993	1998	
Discrete Manufacturing	62	148	19
Process Manufacturing	915	1,725	14
Transportation	305	695	18
Utilities	29	41	7
Telecommunications	115	280	19
Wholesale Distribution	78	142	13
Retail Distribution	171	386	18
Banking and Finance	785	1,640	16
Insurance	192	328	11
Health Services	380	700	13
Education	162	363	18
Business Services	665	1,100	11
Federal Government	326	548	11
State and Local Government	56	91	10
Miscellaneous Industries	148	265	12
Industry-Specific Total	4,389	8,452	14
Generic Markets	5,145	12,205	19
Total EIS	9,534	20,657	17

4. Network Applications Market

User expenditures in the network applications market grew at a rate of 14%—from $2.1 billion in 1992 to $2.4 billion in 1993, as shown in Exhibit III-9. Growth will increase to a five-year CAGR of 20%, and reach a level of $5.9 billion in 1998.

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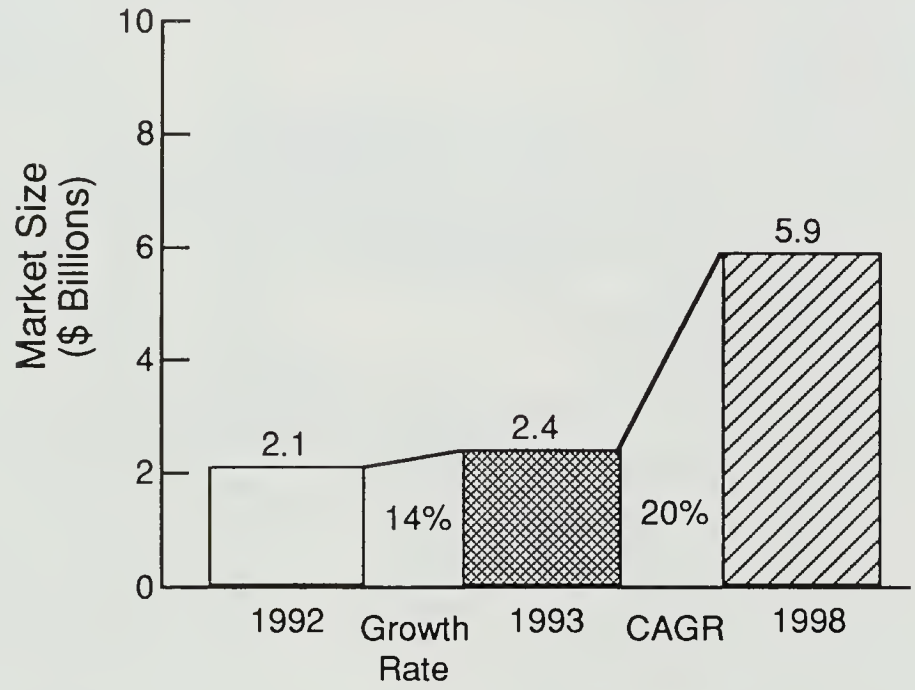
EXHIBIT III-9

U.S. Network Applications Market, 1992-1998



- Network applications amounted to about one-fifth of network services expenditures in 1993.
- Network applications are driven by client needs or demands and by developments in communications, just as EIS is. However, network applications also save postage, office labor and other costs—thereby encouraging electronic payment and mail versus paper-based media.

Exhibit III-10 shows expenditures for network applications by industry markets.

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EXHIBIT III-10

Network Applications Market
User Expenditures by Industry, 1993-1998

Industry Sector	User Expenditures $ Millions		1993-1998 CAGR Percent
	1993	1998	
Discrete Manufacturing	66	186	23
Process Manufacturing	164	540	27
Transportation	117	302	21
Utilities	3	5	11
Telecommunications	26	69	22
Wholesale Distribution	325	1,075	27
Retail Distribution	98	348	29
Banking and Finance	107	219	15
Insurance	64	150	19
Health Services	281	720	21
Education	91	165	16
Business Services	20	48	19
Federal Government	926	1,730	13
State and Local Government	94	286	25
Miscellaneous Industries	10	21	16
Industry-Specific Total	2,392	5,889	20
Generic Markets	NA	NA	NA
Total Network Services	2,392	5,889	20

The most rapid growth is in process manufacturing and wholesale distribution and, after the federal government, wholesale distribution will be the largest market in 1998. Proliferation of E-mail and public bulletin boards accessed by PCs is a strong driver in the market segment.

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Competitive Analysis

This chapter describes IS vendors serving the network services sector. The two segments or submodes of the market that are discussed are:

- Electronic Information Services (EIS) that involve electronic databases which can be accessed but not changed by users who wish to satisfy information needs
- Network Applications or electronic communication—including EDI, electronic mail and VANs

The chapter is divided into the following sections:

- Major Players
- Competitive Positioning
- Vendor Profiles

A. Major Players

The list of top vendors of network services in Exhibit IV-1 illustrates that competitors in this marketplace come from a variety of industries.

- Competitors include publishers of financial information such as Dow Jones and Dun & Bradstreet; book publishers such as McGraw-Hill; a bank, Citicorp; the leading computer manufacturer, IBM; a newspaper holding company; two subsidiaries of manufacturers of noncomputing products; and vendors of information industry services.
- Information services vendors that offer network services tend to be known chiefly for services in other delivery modes such as ADP and CSC.

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EXHIBIT IV-1

Leading Vendors of Network Services in 1992

Rank	Vendor	Estimated Revenue ($ Millions)	Market Share (Percent)	Product Focus
1	TRW (incl. Chilton)	641	6	Credit Data
2	Dow Jones (Telerate)	620	6	Financial
3	Dun & Bradstreet	545	5	Financial
4	Mead Data Central	495	5	Legal & News
5	Equifax	435	4	Credit Data

Exhibit IV-1 illustrates that a group of large vendors dominates the network services market.

- The top five vendors noted in the exhibit account for about one quarter of the 1992 revenue for network services.
- The next 10 vendors add about 30% more to the total revenue for this market segment.

The largest segment or submode of network services is EIS. It provides almost 80% of the revenue for the network services delivery mode. The leading firms in this market provide on-line databases of credit information, investment analysis and equity pricing. In addition to SE products, there are a large number of other (EIS) on-line database products that provide information on topics such as chemicals, agriculture, construction materials, audience ratings and other subjects.

A number of information providers now supply paper-based products or processing services that could expand into EIS in the future.

- IRI and other vendors now use disks, paper or other media to deliver information to clients about sales data they have captured, organized into databases and used to prepare reports and sets of information about buying patterns. Some of these vendors plan to make more information available to clients through on-line databases.

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- Some telemarketing and TV buying services—such as Information Resources—that utilize databases in their internal work may allow clients to access that data on-line.

- Companies with databases of printing templates, overlays or text to aid in the processing necessary to create catalogs or directories, are contemplating services allowing clients to use terminals or PCs to access that information for in-house work.

Nynex, an information provider, just announced their transition plans into EIS. Teaming with Prodigy, Nynex will offer on-line Yellow Pages business listings in the New York/New England area. Nynex will expand the service either by licensing the new software to other RBOCs or by becoming a national provider themselves.

Submodes of network services do not tend to cross-sell each other and generally do not have business characteristics that would make it sensible to combine submodes.

B

Competitive Positioning

The network services marketplace is becoming increasingly more complex. As a result, vendors have become more sophisticated in providing high quality support services. Vendors now provide a twofold, value-added service by providing users with a complete business solution that includes both people and sophisticated delivery systems. Essentially, vendors are focusing their efforts on supporting increased user efficiencies by mapping vendor solutions to those business needs.

Many network services vendors offer a limited number of EIS or network application products or sell products in a limited number of markets. Vendors who offer a wider range of products and serve multiple industries, such as CompuServe, GEIS and Advantis, have a significant advantage in the marketplace.

The influence of the larger Information Services vendors increased significantly over the past few years.

- The newer systems integration and systems operations sectors, though smaller than the more traditional sectors such as professional services and processing services, are growing faster than the traditional sectors and are dominated by the leading vendors.

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- In network services, large Information Services vendors including TRW, ADP, Equifax, GEIS and Advantis (the joint venture of IBM and Sears) play strong roles. However, they are joined by information providers such as Dun & Bradstreet, Dow Jones and communications companies such as BT North America.

- There are numerous smaller firms that are also growing, but overall, the dominance of the larger vendors continues.

- Consolidation is also a factor. The acquisition of Chilton by TRW is an example of such a consolidation.

The formation of Advantis is a major competitive event in the network services marketplace. The Advantis partnership was created by combining IBM's ISSC division with Sears Technology Corporation. If captive business income (services sold to other IBM or Sears business units) were included, Advantis would be considered the largest network services vendor, with $700 million in revenues. (TRW reports revenues of $641 million for 1992.) However, because INPUT does not include captive revenues (that are not available for competitive bid) in its estimates of market size or vendor revenues, adjusting Advantis' financials to consider only noncaptive revenues still shows a company with a very respectable income of $329 million for 1992—more than enough to place it in the top 10 vendors of network services, as measured by revenues.

Customers can use Advantis resources to extend the reach of their existing applications through a variety of networking, messaging and computer services, while outsourcing all or part of their network installation and management.

Advantis' strategic objective is to provide a full range of services and support for electronic markets with extensive, any-to-any interconnections. In keeping with the trend of increasing globalized business activities, IBM signed a letter of intent with the Franco-German venture, Eunetcom, to expand IBM's data communications network in Europe.

Another major vendor, GE Information Services (GEIS), reversed its strategy from last year, when it announced that it would be less aggressive in pursuing VAN transmission opportunities. This approach was based on a judgment that it would be difficult to compete with established carriers, including BT North America (who recently announced its plans to merge some of its network activities with MCI) and AT&T, among others.

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Ameritech, however, the midwestern RBOC, just indicated it plans to invest $472 million in GEIS. The new unit will market data transmission products and services. The investment is structured as a four-year loan, giving Ameritech time to win permission from the federal government to offer long-distance services in the U.S. GEIS currently operates in 31 countries, including the U.S.

C
Vendor Profiles

Profiles of TRW, Equifax and Advantis are provided in this section.

- Included are selected details regarding the network services offered by vendors, vendor strategies and company background.
- Additional information about these vendors and other vendors active in the network services market is contained in reports published by INPUT's Vendor Analysis Program.

1. TRW Information Systems & Services

500 City Parkway West
Orange, CA 92668
(714) 385-7000

a. Company Strategy

TRW Information Systems & Services (ISS) provides numerous services for credit reporting. These include Consumer and Business credit reporting divisions, TRW REDI's property data supporting real estate and equity transactions and TRW Financial Systems' image-based transaction processing.

In December, 1991, TRW Inc. announced a restructuring plan which included the ISS division. Revenues for 1992 reflected a slight loss as the company continued to rightsize by cutting staff, divesting itself of noncore operations and implementing system enhancements.

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b. Company Background

TRW Information Systems & Services Group is an operating unit of TRW Inc., a $7.9 billion company headquartered in Cleveland, Ohio. In addition to the ISS group, TRW provides high-technology products and services to the space, defense and automotive markets.

The TRW Credit Data consumer credit information services business greatly expanded in March 1989 with the acquisition of Chilton Corporation. Chilton provides consumer credit reporting, accounts receivable management and other related services.

c. Products and Services

TRW ISS currently provides a range of network and processing services through the following units:

- TRW Credit Data Services provides consumer credit information services primarily to credit-granting organizations, businesses and individual consumers

- TRW Business Credit Services provides credit information on businesses to commercial credit grantors

- TRW Target Marketing Services provides target marketing database information services to businesses involved in direct marketing

- TRW Financial Systems provides systems engineering and integration services for image-based transaction processing applications to industries that process or handle large volumes of documents such as banking and finance, insurance and government

- TRW REDI Property Data is a joint venture with Elsevier (a diversified Dutch-based publisher) that provides real estate information services to title companies, appraisers, Realtors, brokers, lenders, tax service companies and government agencies

2. Equifax, Inc.

1600 Peachtree St.
N.W. Atlanta, GA 30309
(404) 885-8000

a. Company Strategy

With the acquisition of Telecredit at the end of 1990, Equifax found itself with a new set of products and strategies related to the check guaranty and credit card businesses. Telecredit's experience with low-cost processing centers was also of value to Equifax since its margins were narrow.

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b. Company Background

Equifax began in 1899 as a credit-reporting agency and grew into a company that provided credit reporting, insurance underwriting and product marketing. The company took its present name, Equifax, in 1976. Equifax expanded its operations through acquisition of companies in the U.S., Canada and Europe. Equifax Europe, with headquarters in the U.K., supports the company's products outside North America. Service in England expanded through the acquisition of Next plc in 1990. This resulted in providing consumer credit reporting, credit scoring, marketing and other services throughout the U.K.

c. Products and Services

Credit Information Services, one of Equifax's business units, is a national credit bureau that provides information for consumer and commercial credit reports; services for managing and collecting accounts receivable; and detecting and preventing fraud.

The Insurance and Special Services business unit provides risk management, automated claims information exchange, motor vehicle reports and electronic information on rate and price to the property and casualty industry.

The Marketing Services Unit provides market research, market data analysis, statistical modeling and target marketing information to clients. These clients include direct marketing firms, manufacturers and advertising agencies.

3. Advantis

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Schaumburg, IL 60173-2254
(813) 878-3000

a. Company Strategy

Advantis offers a full spectrum of networking technology solutions—from value-added network services to custom network solutions and total network outsourcing. The company provides complete customer solutions that encompass all these services so that customers can concentrate on their core business while allowing Advantis to handle their networking needs. Advantis plans to provide a full range of services and support for electronic markets with extensive, any-to-any interconnection. They plan to lead in networking technology and are expanding their global network-

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ing capability—possibly through alliances with France Telecom and Deutch Bundespost Telekom. Primary target markets include retail, state and local government, health care, insurance, manufacturing and transportation.

b. Company Background

Advantis was formed December 1, 1992, through a joint venture between the IBM Information Network (INN) and Sears Technology Services, Inc. (STS). IBM's Integrated Systems Solutions Corporation (ISSC) holds the majority interest in Advantis in addition to providing networking support. Advantis combines two of the world's largest information networks into one company that provides customers with network access from 650 cities in more than 90 countries through their worldwide affiliates.

INPUT estimates that approximately 70% of Advantis' billion dollar revenue is derived from network services; 47% comes from its 9,000 noncaptive U.S. customer base. With a running start of 3,000 employees, it is understandable that the Advantis network services business could grow at more than twice the industry average during 1993.

c. Products and Services

Advantis network services includes VANs, custom network solutions and total network outsourcing. Offerings include design, re-engineering, integration, outsourcing and value-added network services.

Advantis has 20% of the EDI market and ranks second to GEIS. Other services include electronic mail, EIS, remote computing, access to more than 2,000 commercial databases, bulletin boards, electronic catalogs and industry specific services.

Advantis plans to provide more value-added services, e.g., client/server and distributed systems, support for LAN's, multiprotocol networking, ISDN, Frame Relay, multimedia, digital broadcast service, increased bandwidth, mobile access to host applications (cellular) and international X.25.

The Sears Technology Services component of this alliance is also significant. STS' 20,000 nationwide phone access sites combined with INN's greater throughput capability provides customers with any-to-any connectivity and high-volume traffic capacity. Their network services provide customers with a ready-to-use, fully managed and secure domestic and international networking technology. Included with these features is the ability to configure almost any combination of terminal-to-host, host-to-host and peer-to-peer connections.

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Conclusions and Recommendations

A
Conclusions

INPUT believes that any impact of the current recession was more than offset by a significant and continuing need for network services. This was due to the increasing need for electronic information.

- Information about materials, production processes, business activity, financial markets and a host of other topics contribute to increases in the amount of on-line information.

- In addition, forces producing increased use in EDI, electronic mail and other network applications stem from pressures corporations place on their suppliers and the desire to save both time and expense by moving information electronically.

In the network services marketplace there was no strong recessionary reaction to lead to an aggregate reduction in the use of electronic information services, value-added networks, EDI or other network applications. The economic slowdown, however, caused individual firms to limit planned use. The overall result of this recession caused buyers to become more active in identifying competitors that can deliver similar services at reduced prices.

In conjunction with the economic downturn, there has been a significant trend toward business downsizing. In many cases, the need for a corresponding reduction in network size and cost created the need for better network planning. With fewer in-house resources, some users experienced more difficulty in analyzing and re-engineering to satisfy network service requirements. Vendors responded by providing increased aid in planning these network services.

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Network services buyers are demanding additional services and aid from network services vendors as part of buyers' present service and fee agreements. Buyers want a means to improve productivity, as well as a way to offset reductions in user staff. Buyers are also more concerned with planning and justifying the use of network services.

Improvements in technology, such as client/server architectures, database developments and network interoperability (LANs and WANs), stimulates the use of network services. One primary driver expanding this marketplace is the increased need to interface with heterogeneous networks. Such interoperability will increase the number of end-points that an electronic mail or EDI system can contact.

Organizations pushing to upgrade interfaces to heterogeneous networks that will allow interconnectivity between geographically dispersed offices are creating enterprise networks. Developing standards in network technology also helps this movement by documenting procedures that allow common interface points for multiple network platform interconnections.

On the demand side, availability of higher line speeds convinced companies that it makes more sense to use electronic mail between sites or to reach customers—e.g., to aid in sending information to order points or manufacturing sites. Higher transmission speeds also promote increased use of EDI and development of multimedia applications. Application systems that will use image processing are now planned and implemented in various industries.

Additionally, the user's role concerning deployment of information technology continues to increase. In many instances, the user is more influential than the information systems manager. In the future, the user's purchasing influence will have positive impacts on size and growth of the Information Services industry.

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B
Recommendations

It is apparent that users are focusing more on their core businesses than in the past. Vendors should view this as an opportunity to provide a tailored service that performs all transaction/network services (including many of the ancillary business functions currently performed by the user). Because many users want to meet the demands of a global economy, network service capabilities that support international requirements will offer a competitive advantage. For the smaller niche market vendor, alliances with foreign carriers may be beneficial.

An additional service that vendors of EIS should consider is providing data on CD ROM, together with new software products that can access that data. This approach is especially effective for static data in on-line databases. EIS vendors can provide CD ROMs along with software products that organize data or provide references between on-line and CD ROM data sources.

With technology changing so rapidly, it is imperative that vendors stay in tune with its evolution and plan for potential opportunities. Vendors must position themselves to support any-to-any network connectivity. This connectivity will include interoperability of EDI, electronic commerce, imaging and even the possibility to support certain segments of a user's enterprise network. And as multimedia technology develops, users will make significant commitments to this audio, image, full motion video and textual medium.

The network environment, as with other elements of the IS network, has become heavily influenced by users. Network service vendors must recognize this role change. Users now want to be involved in planning and operating EIS, EDI, electronic mail and other network applications systems. However, users have difficulty evaluating, selecting and operating a network service. Thus, more than in the past, vendors need to take a consultative approach and explain the network applications or software provided with an EIS to help users understand and evaluate what their network services can accomplish.

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Forecast and Reconciliation

A

Forecast Database

Exhibit A-1 presents the overall 1992-1998 forecast of user expenditures for the network services delivery mode. Forecasts for the electronic information services and network applications submodes are presented in Exhibits A-2 and A-3.

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EXHIBIT A-1

Network Services, User Expenditures Forecast by Market Sector, 1992-1998

Market Sectors	1992 ($M)	Growth 92-93 (%)	1993 ($M)	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	1998 ($M)	CAGR 93-98 (%)
Delivery Mode Total	10,380	15	11,926	13,882	16,268	19,126	22,553	26,546	17
Vertical Industry Markets	6,025	13	6,781	7,774	9,018	10,511	12,303	14,341	16
Banking and Finance	798	12	892	1,008	1,164	1,358	1,592	1,859	16
Business Services	633	8	685	740	801	887	1,003	1,148	11
Discrete Manufacturing	106	21	128	155	188	227	275	334	21
Education	216	17	253	297	348	407	478	553	17
Federal Government	1,213	3	1,252	1,364	1,562	1,786	2,036	2,278	1
Health Services	575	15	661	775	902	1,051	1,220	1,420	17
Insurance	236	8	256	298	347	381	431	478	13
Miscellaneous	138	14	158	181	204	231	261	286	13
Process Manufacturing	938	15	1,079	1,246	1,438	1,666	1,940	2,265	16
Retail Distribution	221	22	269	328	400	490	602	734	22
State and Local Government	125	20	150	179	214	258	312	377	20
Telecommunications	119	18	141	168	202	243	291	349	20
Transportation	350	21	422	498	586	708	842	997	19
Utilities	30	7	32	35	37	39	43	46	8
Wholesale Distribution	327	23	403	502	625	779	977	1,217	25
Generic Markets	4,355	18	5,145	6,108	7,250	8,615	10,250	12,205	19
Online Databases	2,895	16	3,345	3,896	4,535	5,280	6,150	7,170	16
- Securities	1,165	15	1,340	1,556	1,805	2,100	2,435	2,830	16
- Credit	1,420	15	1,640	1,910	2,225	2,590	3,020	3,520	17
- Economic/Other	310	18	365	430	505	590	695	820	18
Online News Services	1,460	23	1,800	2,212	2,715	3,335	4,100	5,035	23
- Bibliography/Text	450	24	560	687	845	1,035	1,270	1,560	23
- News	1,010	23	1,240	1,525	1,870	2,300	2,830	3,475	23

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EXHIBIT A-2

Electronic Information Services, User Expenditures Forecast by Market Sector, 1992-1998

Market Sectors	1992 ($M)	Growth 92-93 (%)	1993 ($M)	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	1998 ($M)	CAGR 93-98 (%)
Delivery Submode Total	8,280	15	9,534	11,061	12,880	15,037	17,615	20,657	17
Vertical Industry Markets	3,925	12	4,389	4,953	5,630	6,422	7,365	8,452	14
Banking and Finance	702	12	785	885	1,022	1,193	1,402	1,640	16
Business Services	615	8	665	715	770	850	960	1,100	11
Discrete Manufacturing	52	19	62	74	88	104	124	148	19
Education	137	18	162	191	225	265	313	363	18
Federal Government	315	3	326	355	391	429	488	548	11
Health Services	340	12	380	420	487	545	610	700	13
Insurance	178	8	192	228	260	282	306	328	11
Miscellaneous	130	14	148	169	190	215	243	265	12
Process Manufacturing	807	13	915	1,040	1,180	1,340	1,520	1,725	14
Retail Distribution	145	18	171	202	238	281	332	386	18
State and Local Government	50	12	56	62	68	75	83	91	10
Telecommunications	98	17	115	137	164	196	234	280	19
Transportation	260	17	305	355	414	500	585	695	18
Utilities	27	7	29	31	33	35	38	41	7
Wholesale Distribution	69	13	78	89	100	112	127	142	13
Generic Markets	4,355	18	5,145	6,108	7,250	8,615	10,250	12,205	19
Online Databases	2,895	16	3,345	3,896	4,535	5,280	6,150	7,170	16
- Securities	1,165	15	1,340	1,556	1,805	2,100	2,435	2,830	16
- Credit	1,420	15	1,640	1,910	2,225	2,590	3,020	3,520	17
- Economic/Other	310	18	365	430	505	590	695	820	18
Online News Services	1,460	23	1,800	2,212	2,715	3,335	4,100	5,035	23
- Bibliography/Text	450	24	560	687	845	1,035	1,270	1,560	23
- News	1,010	23	1,240	1,525	1,870	2,300	2,830	3,475	23

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EXHIBIT A-3

Network Applications, User Expenditures Forecast by Market Sector, 1992-1998

Market Sectors	1992 ($M)	Growth 92-93 (%)	1993 ($M)	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	1998 ($M)	CAGR 93-98 (%)
Delivery Submode Total	2,100	14	2,392	2,821	3,388	4,089	4,938	5,889	20
Vertical Industry Markets	2,100	14	2,392	2,821	3,388	4,089	4,938	5,889	20
Banking and Finance	96	12	107	123	142	165	190	219	15
Business Services	18	11	20	25	31	37	43	48	19
Discrete Manufacturing	54	22	66	81	100	123	151	186	23
Education	79	15	91	106	123	142	165	190	16
Federal Government	898	3	926	1,009	1,171	1,357	1,548	1,730	13
Health Services	235	20	281	355	415	506	610	720	21
Insurance	58	10	64	70	87	99	125	150	19
Miscellaneous	8	25	10	12	14	16	18	21	16
Process Manufacturing	131	25	164	206	258	326	420	540	27
Retail Distribution	76	29	98	126	162	209	270	348	29
State and Local Government	75	25	94	117	146	183	229	286	25
Telecommunications	21	24	26	31	38	47	57	69	22
Transportation	90	30	117	143	172	208	257	302	21
Utilities	3	0	3	4	4	4	5	5	11
Wholesale Distribution	258	26	325	413	525	667	850	1,075	27

B

Forecast Reconciliation

Exhibits A-4, A-5 and A-6 present reconciliations with the forecast databases for the 1992 network services report and two submodes, electronic information services and network applications.

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EXHIBIT A-4

1993 Database Reconciliation, Network Services Market

Delivery Modes	1992 Market				1997 Market				92-97 CAGR per data 92 Rpt (%)	92-97 CAGR per data 93 Rpt (%)
	1992 Market (Forecast) ($M)	1993 Report (Actual) ($M)	Variance From 1992 Forecast ($M)	Variance From 1992 Forecast (%)	1992 Market (Forecast) ($M)	1993 Report (Forecast) ($M)	Variance From 1992 Forecast ($M)	Variance From 1992 Forecast (%)		
Delivery Mode Total	10,443	10,380	-63	-0	22,541	22,553	12	0	17	17
Vertical Industry Markets	6,089	6,025	-64	-1	12,283	12,303	20	0	15	15
Banking and Finance	790	798	8	1	1,626	1,592	-34	-2	16	15
Business Services	628	633	5	0	1,275	1,003	-272	-21	15	10
Discrete Manufacturing	104	106	2	2	280	275	-5	-2	22	21
Education	216	216	0	0	478	478	0	0	17	17
Federal Government	1,275	1,213	-62	-5	1,530	2,036	506	33	4	11
Health Services	579	575	-4	-0	1,351	1,220	-131	-10	18	16
Insurance	236	236	0	0	397	431	34	9	11	13
Miscellaneous	138	138	0	0	271	261	-10	-4	14	14
Process Manufacturing	949	938	-11	-1	2,070	1,940	-130	-6	17	16
Retail Distribution	221	221	0	0	602	602	0	0	22	22
State and Local Government	125	125	0	0	310	312	2	0	20	20
Telecommunications	118	119	1	0	279	291	12	4	19	20
Transportation	354	350	-4	-1	859	842	-17	-2	19	19
Utilities	30	30	0	0	42	43	1	2	7	7
Wholesale Distribution	326	327	1	0	913	977	64	7	23	24
Generic Markets	4,354	4,355	1	0	10,258	10,250	-8	-0	19	19
Online Databases	2,873	2,895	22	0	6,089	6,150	61	1	16	16
- Securities	1,161	1,165	4	0	2,437	2,435	-2	-0	16	16
- Credit	1,406	1,420	14	0	2,952	3,020	68	2	16	16
- Economic/Other	306	310	4	1	700	695	-5	-0	18	18
Online News Services	1,481	1,460	-21	-1	4,169	4,100	-69	-2	23	23
- Bibliography/Text	458	450	-8	-2	1,288	1,270	-18	-1	23	23
- News	1,023	1,010	-13	-1	2,881	2,830	-51	-2	23	23

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EXHIBIT A-5

1993 Database Reconciliation, Electronic Information Services Market

Delivery Modes	1992 Market				1997 Market				92-97 CAGR per data 92 Rpt (%)	92-97 CAGR per data 93 Rpt (%)
	1992 Market (Forecast) ($M)	1993 Report (Actual) ($M)	Variance From 1992 Forecast ($M)	Variance From 1992 Forecast (%)	1992 Market (Forecast) ($M)	1993 Report (Forecast) ($M)	Variance From 1992 Forecast ($M)	Variance From 1992 Forecast (%)		
Total Electronic Information Services Market	8,303	8,280	-23	-0	18,062	17,615	-447	-2	17	16
Vertical Industry Markets	3,949	3,925	-24	-0	7,804	7,365	-439	-6	15	13
Banking and Finance	695	702	7	1	1,431	1,402	-29	-2	16	15
Business Services	610	615	5	0	1,227	960	-267	-22	15	9
Discrete Manufacturing	51	52	1	2	127	124	-3	-2	20	19
Education	137	137	0	0	313	313	0	0	18	18
Federal Government	330	315	-15	-5	370	488	118	32	2	9
Health Services	344	340	-4	-1	662	610	-52	-8	14	12
Insurance	178	178	0	0	306	306	0	0	11	11
Miscellaneous	130	130	0	0	250	243	-7	-3	14	13
Process Manufacturing	821	807	-14	-2	1,724	1,520	-204	-12	16	13
Retail Distribution	145	145	0	0	332	332	0	0	18	18
State and Local Government	50	50	0	0	80	83	3	4	10	11
Telecommunications	97	98	1	1	222	234	12	5	18	19
Transportation	265	260	-5	-2	595	585	-10	-2	18	18
Utilities	27	27	0	0	38	38	0	0	7	7
Wholesale Distribution	69	69	0	0	127	127	0	0	13	13
Generic Markets	4,354	4,355	1	0	10,258	10,250	-8	-0	19	19
Online Databases	2,873	2,895	22	0	6,089	6,150	61	1	16	16
- Securities	1,161	1,165	4	0	2,437	2,435	-2	-0	16	16
- Credit	1,406	1,420	14	0	2,952	3,020	68	2	16	16
- Economic/Other	306	310	4	1	700	695	-5	-0	18	18
Online News Services	1,481	1,460	-21	-1	4,169	4,100	-69	-2	23	23
- Bibliography/Text	458	450	-8	-2	1,288	1,270	-18	-1	23	23
- News	1,023	1,010	-13	-1	2,881	2,830	-51	-2	23	23

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EXHIBIT A-6

1993 Database Reconciliation, Network Applications Market

Delivery Modes	1992 Market				1997 Market				92-97 CAGR per data 92 Rpt (%)	92-97 CAGR per data 93 Rpt (%)
	1992 Market (Forecast) ($M)	1993 Report (Actual) ($M)	Variance From 1992 Forecast ($M)	Variance From 1992 Forecast (%)	1992 Market (Forecast) ($M)	1993 Report (Forecast) ($M)	Variance From 1992 Forecast ($M)	Variance From 1992 Forecast (%)		
Total Network Applications Market	2,140	2,100	-40	-2	4,480	4,938	458	10	16	19
Vertical Industry Markets	2,140	2,100	-40	-2	4,480	4,938	458	10	16	19
Banking and Finance	95	96	1	1	195	190	-5	-3	15	15
Business Services	18	18	0	0	48	43	-5	-10	22	19
Discrete Manufacturing	53	54	1	2	153	151	-2	-1	24	23
Education	79	79	0	0	165	165	0	0	16	16
Federal Government	945	898	-47	-5	1,160	1,548	388	33	4	12
Health Services	235	235	0	0	689	610	-79	-11	24	21
Insurance	58	58	0	0	91	125	34	37	9	17
Miscellaneous	8	8	0	0	21	18	-3	-14	21	18
Process Manufacturing	128	131	3	2	346	420	74	21	22	26
Retail Distribution	76	76	0	0	270	270	0	0	29	29
State and Local Government	75	75	0	0	230	229	-1	-0	25	25
Telecommunications	21	21	0	0	57	57	0	0	22	22
Transportation	89	90	1	1	264	257	-7	-3	24	23
Utilities	3	3	0	0	5	5	0	0	11	11
Wholesale Distribution	257	258	1	0	786	850	64	8	25	27

In general, there were minor changes in forecast and actual industry and generic markets for 1992, with all variances (except the federal government market sector) in an acceptable 1% to 2% range.

As a result of stringent federal budget reductions and ongoing deficit reduction programs, INPUT's forecast for this market sector for most delivery modes was significantly reduced for the near term, resulting in lower-than-forecast expenditures for network services in 1992. The 1997 federal sector forecast in this report is 33% higher than last year, due to the fact that this market, after applying initial budgetary constraints, will replace displaced internal department information bases with network services, and better budget funds to access electronic data and use network resources. The net result will be higher 1997 expenditures from both a higher growth rate and smaller base leverage in 1992. CAGR from 1992 to 1997 is now expected to be 11% for the federal sector (up from 4% in last year's report) and the 1993 to 1998 CAGR will be 13%.

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Market variances for 1997 reflect adjustments for both slower than anticipated economic recovery and specific industry trends. Most variances are within 10% or less of 1992 figures, except for federal business services, health services, insurance and miscellaneous market sectors. Higher rate of growth and 1997 expenditures for insurance result from both the small 1992 base and market restructuring as major carriers move from large, centralized legacy systems to efficient client/server architectures that satisfy their data-intensive applications. Business services and miscellaneous markets are responding to lingering effects of the slow recovery, while the health services industry put many buying decisions on hold until the continuing uncertainties surrounding the Clinton administration's reform efforts can be resolved.

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